

Table of Contents

Appendix B Excerpts from the Appliance Efficiency Regulations	1
Table T-1 Normal Impedance Ranges for Liquid-Immersed Transformers.....	1
Table T-2 Normal Impedance Ranges for Dry-Type Transformers.....	1
Table A-1 Non-Commercial Refrigerator, Refrigerator-Freezer, and Freezer Test Methods	2
Table A-2 Commercial Refrigerators, Refrigerator-Freezer, and Freezer Test Methods.....	2
Table B-1 Room Air Conditioner, Room Air-Conditioning Heat Pump, Packaged Terminal Air Conditioner, and Packaged Terminal Heat Pump Test Methods.....	3
Table C-1 Central Air Conditioner Test Methods	3
Table D-1 Spot Air Conditioner, Ceiling Fan, Ceiling Fan Light Kit, Evaporative Cooler, Whole House Fan, Residential Exhaust Fan, and Dehumidifier Test Methods.....	4
Table E-1 Gas and Oil Space Heater Test Methods.....	5
Table F-1 Small Water Heater Test Methods	6
Table F-2 Large Water Heater Test Methods	7
Table G Pool Heater Test Methods	8
Table P-1 Clothes Washer Test Methods	8
Table R Cooking Product and Food Service Equipment Test Methods.....	9
Table A-3 Standards for Non-Commercial Refrigerators, Refrigerator-Freezers,.....	10
and Freezers Manufactured on or After July 1, 2001.....	10
Table A-4 Standards for Commercial Refrigerators, Refrigerator-Freezers,.....	10
and Freezers Manufactured on or After January 1, 2010	10
Table A-5 Standards for Automatic Commercial Ice Makers	11
Manufactured on or After January 1, 2010	11
Table B-2 Standards for Room Air Conditioners and Room Air-Conditioning Heat Pumps.....	12
Table B-3 Standards for Packaged Terminal Air Conditioners and Packaged Terminal Heat Pumps.....	12

Table C-2 Standards for Single Phase Air-Cooled Air Conditioners with	13
Cooling Capacity Less than 65,000 Btu per Hour and Single Phase Air-Source Heat	13
Pumps with Cooling Capacity Less than 65,000 Btu per Hour, Not Subject to EPAct.....	13
Table C-3 Standards for Air-Cooled Air Conditioners and Air-Source Heat Pumps Subject to EPAct.....	14
(Standards Effective January 1, 2010 do not apply To Single Package Vertical Air Conditioners)	14
Table C-4 Standards for Evaporatively-Cooled Air Conditioners.....	15
Table C-5	15
Standards for Water-Cooled Air Conditioners and Water-Source Heat Pumps.....	15
Table C-6 Standards for Single Package Vertical Air Conditioners and Single Package Vertical Heat Pumps Manufactured on or After January 1, 2010.....	16
Table D-2 Standards for Dehumidifiers.....	16
Table E-2 Standards for Gas Wall Furnaces, Floor Furnaces, and Room Heaters	17
Table E-3 Standards for Gas- and Oil-Fired Central Boilers and Electric Residential Boilers	18
Table E-4 Standards for Gas- and Oil-Fired Central Furnaces.....	19
Table F-3 Standards for Large Water Heaters Effective October 29, 2003	19
Table F-4 Standards for Small Federally-Regulated Water Heaters	20
Table H-1 Standards for Plumbing Fittings	20
Table I Standards for Plumbing Fixtures.....	21
Table J-1 Standards for Fluorescent Lamp Ballasts and Replacement Fluorescent Lamp Ballasts	21
Table J-2	21
Standards for Fluorescent Lamp Ballasts ¹	21
Table K-1	22
Standards for Federally-Regulated General Service Fluorescent Lamps.....	22
Table K-2	22
Standards for Federally-Regulated Incandescent Reflector Lamps	22

Table K-3	23
Standards for Medium Base Compact Fluorescent Lamps	23
Table K-4 Standards for Federally-Regulated General Service Incandescent Lamps.....	23
Table K-5 Standards for Federally-Regulated Modified Spectrum General Service Incandescent Lamps	24
Table K-6 Standards for Federally Regulated Candelabra Base Incandescent Lamps and Intermediate Base Incandescent Lamps.....	24
Table M-1 Standards for Traffic Signals for Vehicle and Pedestrian Control.....	24
Table O Standards for Dishwashers	24
Table P-2 Energy Efficiency Standards for Residential Clothes Washers	25
Table Q Standards for Clothes Dryers.....	25
Table S-1 Standards for Electric Motors	25
Table S-2 Standards for Electric Motors Manufactured on or After December 19, 2010.....	26
Table T-3 Standards for Low-Voltage Dry-Type Distribution Transformers	26
Table T-4 Standards for Liquid-Immersed Distribution Transformers	27
Table T-5 Standards for Medium-Voltage Dry-Type Distribution Transformers.....	28
Table U-1 Standards for Class A External Power Supplies That are Federally Regulated.....	28
Table C-7 Standards for Air-Cooled Air Conditioners and Air-Source Heat Pumps	29
Table P-3 Water Efficiency Standards for Clothes Washers.....	30
Table A-6 Standards for Wine Chillers.....	30
Table A-7 Standards for Freezers that are Consumer Products.....	30
Table A-8 Energy Design Standards for Walk-In Coolers and Walk-In Freezers Manufactured Before January 1, 2009.....	31
Table A-9 Standards for Reach-In Cabinets, Pass-Through Cabinets, Roll-In or Roll-Through Cabinets Manufactured Prior to January 1, 2010, and Wine Chillers that are Not Consumer Products.....	32
Table A-10 Standards for Refrigerated Canned and Bottled Beverage Vending Machines	33
Table A-11 Standards for Automatic Commercial Ice-Makers.....	33
Table C-8 Standards for Ground Water-Source and Ground-Source Heat Pumps	34

Table C-9 Standards for Air-Cooled Computer Room Air Conditioners.....	34
Table C-10 Standards for Water-Cooled, Glycol-Cooled, and Evaporatively-Cooled Computer Room Air Conditioners.....	34
Table E-5 Standards for Boilers.....	35
Table E-6 Standards for Furnaces.....	35
Table E-7 Standards for Duct Furnaces	35
Table E-8 Standards for Unit Heaters Manufactured Before August 8, 2008	36
Table F-5 Standards for Small Water Heaters that are Not Federally-Regulated Consumer Products.....	36
Table H-2 Standards for Tub Spout Diverters.....	37
Table K-7 Standards for State-Regulated General Service Incandescent Lamps	37
Table K-8 Standards for State-Regulated Incandescent Reflector Lamps	38
Table K-9 Standards for State-Regulated General Service Incandescent Lamps -Tier I	38
Table K-10 Standards for State-Regulated General Service Lamps -Tier II.....	38
Table K-11 Standards for State-Regulated Modified Spectrum General Service Incandescent Lamps -Tier I.....	38
Table L-1 Ultrasound Maximum Decibel Values.....	39
Table M-2 Standards for Traffic Signal Modules for Pedestrian Control Sold or Offered for Sale in California.....	39
Table N-1 Standards for Metal Halide Luminaires Manufactured Before January 1, 2009.....	39
Table N-2 Standards for Under-Cabinet Luminaires.....	40
Table N-3 Minimum Requirements for Portable LED Luminaires, and Portable Luminaires with LED Light Engines with Integral Heat Sink	40
Table U-2 Standards for State-Regulated External Power Supplies Effective January 1, 2007 for external power supplies used with laptop computers, mobile phones, printers, print servers, scanners, personal digital assistants (PDAs), and digital cameras. Effective July 1, 2007 for external power supplies used with wireline telephones and all other applications.	40
Table U-3 Standards for State-Regulated External Power Supplies	41
Table V-1 Standards for Consumer Audio and Video Equipment.....	41
Table V-2 Standards for Televisions.....	41

<i>Table Contents</i>	<i>Page v</i>
-----------------------	---------------

Table W-1 Standards for Large Battery Charger Systems	41
---	----

Table W-2 Standards for Small Battery Charger Systems.....	41
--	----

Appendix B Excerpts from the Appliance Efficiency Regulations

Table T-1 Normal Impedance Ranges for Liquid-Immersed Transformers

<i>Single-phase</i>		<i>Three-phase</i>	
<i>kVA</i>	<i>Impedance (%)</i>	<i>kVA</i>	<i>Impedance (%)</i>
10	1.0–4.5	15	1.0–4.5
15	1.0–4.5	30	1.0–4.5
25	1.0–4.5	45	1.0–4.5
37.5	1.0–4.5	75	1.0–5.0
50	1.5–4.5	112.5	1.2–6.0
75	1.5–4.5	150	1.2–6.0
100	1.5–4.5	225	1.2–6.0
167	1.5–4.5	300	1.2–6.0
250	1.5–6.0	500	1.5–7.0
333	1.5–6.0	750	5.0–7.5
500	1.5–7.0	1000	5.0–7.5
667	5.0–7.5	1500	5.0–7.5
833	5.0–7.5	2000	5.0–7.5
		2500	5.0–7.5

Table T-2 Normal Impedance Ranges for Dry-Type Transformers

<i>Single-phase</i>		<i>Three-phase</i>	
<i>kVA</i>	<i>Impedance (%)</i>	<i>kVA</i>	<i>Impedance (%)</i>
15	1.5–6.0	15	1.5–6.0
25	1.5–6.0	30	1.5–6.0
37.5	1.5–6.0	45	1.5–6.0
50	1.5–6.0	75	1.5–6.0
75	2.0–7.0	112.5	1.5–6.0
100	2.0–7.0	150	1.5–6.0
167	2.5–8.0	225	3.0–7.0
250	3.5–8.0	300	3.0–7.0
333	3.5–8.0	500	4.5–8.0
500	3.5–8.0	750	5.0–8.0
667	5.0–8.0	1000	5.0–8.0
833	5.0–8.0	1500	5.0–8.0
		2000	5.0–8.0
		2500	5.0–8.0

Table A-1 Non-Commercial Refrigerator, Refrigerator-Freezer, and Freezer Test Methods

Appliance	Test Method
Non-commercial refrigerators, designed for the refrigerated storage of food at temperatures above 32°F and below 39°F, configured for general refrigerated food storage; refrigerator-freezers; and freezers.	10 CFR Sections 430.23(a) (Appendix A1 to Subpart B of Part 430) (2008) and 430.23(b) (Appendix B1 to Subpart B of Part 430) (2008), as applicable
Wine chillers that are consumer products	10 CFR Section 430.23(a) (Appendix A1 to Subpart B of Part 430) (2008) with the following modifications: Standardized temperature as referred to in Section 3.2 of Appendix A1 shall be 55°F (12.8°C). The calculation of test cycle energy expended (ET) in Section 5.2.1.1 of Appendix A1 shall be made using the modified formula: $ET = (EP \times 1440 \times k) / T$ Where $k = 0.85$

Table A-2 Commercial Refrigerators, Refrigerator-Freezer, and Freezer Test Methods

Appliance	Test Method
Automatic commercial ice-makers	ARI 810-2003 Harvest rate (lbs. of ice/24 hours) shall be reported within 5% of the tested value.
Refrigerated bottled or canned beverage vending machines	ANSI/ASHRAE 32.1-2004 Volume of multi-package units shall be measured using ANSI/AHAM HRF-1-(2004)
Refrigerated buffet and preparation tables	ANSI/ASTM F2143-01
Other commercial refrigerators, refrigerator-freezers, and freezers, with doors	Volume shall be measured using ANSI/AHAM HRF-1-2004. Energy consumption shall be measured using 10 CFR Section 431.64 (2008).
Other commercial refrigerators, refrigerator-freezers, and freezers, without doors	Volume measured using ANSI/AHAM HRF-1-2004. Energy consumption measured using 10 CFR Section 431.64 (2008).

Table B-1 Room Air Conditioner, Room Air-Conditioning Heat Pump, Packaged Terminal Air Conditioner, and Packaged Terminal Heat Pump Test Methods

Appliance	Test Method
Room air conditioners and room air-conditioning heat pumps	10 CFR Section 430.23(f) (Appendix F to Subpart B of Part 430) (2008) (Cooling) ASHRAE 58-74 (Heating)
Packaged terminal air conditioners and packaged terminal heat pumps	ANSI/ARI 310/380-2004

Table C-1 Central Air Conditioner Test Methods

Appliance	Test Method
Computer Room Air Conditioners	ANSI/ASHRAE 127-2001
Other electric-powered unitary air-conditioners and electric-powered heat pumps	
air-cooled air conditioners and air-source heat pumps	
< 65,000 Btu/hr	ANSI/ARI 210/240-2003
≥ 65,000 and < 135,000 Btu/hr	ANSI/ARI 340/360-2004
≥ 135,000 Btu/hr	ANSI/ARI 340/360-2004
evaporatively-cooled air conditioners	
< 65,000 Btu/hr	ANSI/ARI 210/240-2003
≥ 65,000 Btu/hr	ANSI/ARI 340/360-2004
water-source single package and split system heat pumps	ISO 13256-1-1998
water-cooled single-package and split system air conditioners	
< 65,000 Btu/hr	ANSI/ARI 210/240-2003
≥ 65,000 and < 135,000 Btu/hr	ANSI/ARI 340/360-2004
≥ 135,000 Btu/hr	ANSI/ARI 340/360-2004
ground water-source heat pumps	ARI/ISO-13256-1:1998
ground-source closed-loop heat pumps	ARI/ISO-13256-1:1998
Gas-fired air conditioners and gas-fired heat pumps	ANSI Z21.40.4-1996 as modified by CEC, Efficiency Calculation Method for Gas-Fired Heat Pumps as a New Compliance Option (1996)

Table D-1 Spot Air Conditioner, Ceiling Fan, Ceiling Fan Light Kit, Evaporative Cooler, Whole House Fan, Residential Exhaust Fan, and Dehumidifier Test Methods

<i>Appliance</i>	<i>Test Method</i>
Spot Air Conditioners	ANSI/ASHRAE 128-2001
Ceiling Fans, Except Low-Profile Ceiling Fans	10 CFR Section 430.23(w) (Appendix U to Subpart B of Part 430) (2008)
Ceiling Fan Light Kits	10 CFR Section 430.23(x) (Appendix V to Subpart B of Part 430) (2008)
Evaporative Coolers	<p>ANSI/ASHRAE 133-2001 for packaged direct evaporative coolers and packaged indirect/direct evaporative coolers; ANSI/ASHRAE 143-2000 for packaged indirect evaporative coolers; with the following modifications for both test methods:</p> <ul style="list-style-type: none"> (A) Saturation effectiveness and total power of direct evaporative coolers and cooling effectiveness and total power of indirect evaporative coolers shall be measured at an airflow rate that corresponds to 0.3" external static pressure; (B) indoor dry bulb temperature shall be 80°F; (C) outdoor dry bulb temperature shall be 91°F; (D) outdoor wet bulb temperature shall be 69°F; and (E) Evaporative Cooler Efficiency Ratio (ECER) shall be calculated using the following formula: $\text{ECER} = 1.08^* (t_{in} - (t_{db} - \varepsilon * (t_{db} - t_{wb}))) * Q / W$ <p>Where: t_{in} = indoor dry bulb temperature from (B) t_{db} = outdoor dry bulb temperature from (C) t_{wb} = outdoor wet bulb temperature from (D) ε = measured saturation effectiveness divided by 100 or measured cooling effectiveness from (A) Q = measured air flow rate (cfm) from (A) W = measured total power (watts) from (A)</p>
Whole House Fans	HVI-916, tested with manufacturer-provided louvers in place (2005)
Dehumidifiers	10 CFR Section 430.23(z) (Appendix X to Subpart B of Part 430) (2008)
Residential Exhaust Fans	HVI-916 (2005)

Table E-1 Gas and Oil Space Heater Test Methods

Appliance	Test Method
Central furnaces	
< 225,000 Btu/hr, single phase	10 CFR Section 430.23(n) (Appendix N to Subpart B of Part 430) (2008)
< 225,000 Btu/hr, three phase	10 CFR Section 430.23(n) (Appendix N to Subpart B of Part 430) (2008) or ANSI Z21.47-2001 (at manufacturer's option)
≥ 225,000 Btu/hr	
gas-fired	ANSI Z21.47-1998
oil-fired	UL 727-1994
Gas infrared heaters	
patio heaters	ASTM F2644-07
gas-fired high-intensity infrared heaters	ANSI Z83.19-2001
gas-fired low-intensity infrared heaters	ANSI Z83.20-2001
Unit heaters	
gas-fired	ANSI Z83.8-2002*
oil-fired	UL 731-1995*
Gas duct furnaces	ANSI Z83.8-2002
Boilers	
< 300,000 Btu/hr	10 CFR Section 430.23(n) (Appendix N to Subpart B of Part 430) (2008)
≥ 300,000 Btu/hr	HI-G BTS-2000
Wall furnaces, floor furnaces, and room heaters	10 CFR Section 430.23(o) (Appendix O to Subpart B of Part 430) (2008)
<p>*To calculate maximum energy consumption during standby, measure the gas energy used in one hour (in Btus) and the electrical energy used (in watt-hours) over a one-hour period, when the main burner is off. Divide Btus and watt-hours by one hour to obtain Btus per hour and watts. Divide Btus per hour by 3.412 to obtain watts. Add watts of gas energy to watts of electrical energy to obtain standby energy consumption in watts.</p>	

Table F-1 Small Water Heater Test Methods

Appliance	Test Method
Small water heaters that are federally-regulated consumer products	10 CFR Section 430.23(e) (Appendix E to Subpart B of Part 430) (2008)
Small water heaters that are not federally-regulated consumer products	
Gas and oil storage-type < 20 gallons rated capacity	ANSI/ASHRAE 118.2-1993
Booster water heaters	ANSI/ASTM F2022-00 (for all matters other than volume) ANSI Z21.10.3-1998 (for volume)
Hot water dispensers	Test Method in 1604(f)(4)
Mini-tank electric water heaters	Test Method in 1604(f)(5)
All others	10 CFR Section 430.23(e) (Appendix E to Subpart B of Part 430) (2008)

Table F-2 Large Water Heater Test Methods

Appliance	Energy Efficiency Descriptor	Use Test setup equipment and procedures in subsection labeled "Method of Test" of	With these additional stipulations
Gas-fired Storage and Instantaneous Water Heaters and Hot Water Supply Boilers*	Thermal Efficiency	ANSI Z21.10.3–1998, §2.9**	<p>A. For all products, the duration of the standby loss test shall be until whichever of the following occurs first after you begin to measure the fuel and/or electric consumption: (1) The first cutout after 24 hours or (2) 48 hours, if the water heater is not in the heating mode at that time.</p> <p>B. For oil and gas products, the standby loss in Btu per hour must be calculated as follows: $SL \text{ (Btu per hour)} = S \text{ (\% per hour)} \times 8.25 \text{ (Btu/gal-F)} \times \text{Measured Volume (gal)} \times 70(\text{°F})$.</p>
	Standby Loss	ANSI Z21.10.3–1998, §2.10**	
Oil-fired Storage and Instantaneous Water Heaters and Hot Water Supply Boilers*	Thermal Efficiency	ANSI Z21.10.3–1998, §2.9**	<p>C. For oil-fired products, apply the following in conducting the thermal efficiency and standby loss tests:</p> <p>(1) Venting Requirements—Connect a vertical length of flue pipe to the flue gas outlet of sufficient height so as to meet the minimum draft specified by the manufacturer.</p> <p>(2) Oil Supply—Adjust the burner rate so that: (a) The hourly Btu input rate lies within ± 2 percent of the manufacturer's specified input rate, (b) the CO_2 reading shows the value specified by the manufacturer, (c) smoke in the flue does not exceed No. 1 smoke as measured by the procedure in ASTM-D-2156-80, and (d) fuel pump pressure lies within ± 10 percent of manufacturer's specifications.</p>
	Standby Loss	ANSI Z21.10.3–1998, §2.10**	
Electric Storage and Instantaneous Water Heaters			<p>D. For electric products, apply the following in conducting the standby loss test:</p> <p>(1) Assume that the thermal efficiency (E_t) of electric water heaters with immersed heating elements is 98 percent.</p> <p>(2) Maintain the electrical supply voltage to within ± 5 percent of the center of the voltage range specified on the water heater nameplate.</p> <p>(3) If the set up includes multiple adjustable thermostats, set the highest one first to yield a maximum water temperature in the specified range as measured by the topmost tank</p>

			thermocouple. Then set the lower thermostat(s) to yield a maximum mean tank temperature within the specified range.
*As to hot water supply boilers with a capacity of less than 10 gallons, these test methods became mandatory on October 21, 2005.			
**Incorporated by reference, see 10 CFR 431.105 (2008).			

Table G Pool Heater Test Methods

Appliance	Test Method		
Gas-fired and oil-fired pool heaters	ANSI Z21.56-1994		
Electric resistance pool heaters	ANSI/ASHRAE 146-1998		
Heat pump pool heaters	ANSI/ASHRAE 146-1998, as modified by Addendum Test Procedure published by Pool Heat Pump Manufacturers Association dated April, 1999, Rev 4: Feb. 28, 2000:		
Reading	Standard Temperature Rating	Low-Temperature Rating	Spa Conditions Rating
Air Temperature Dry-bulb Wet-bulb	27.0°C (80.6°F) 21.7°C (71.0°F)	10.0°C (50.0°F) 6.9°C (44.4°F)	27.0°C (80.6°F) 21.7°C (71.0°F)
Relative Humidity	63%	63%	63%
Pool Water Temperature	26.7°C (80.0°F)	26.7°C (80.0°F)	40.0°C (104.0°F)

Table P-1 Clothes Washer Test Methods

Appliance	Test Method
Clothes washers that are consumer products	10 CFR Section 430.23(j) (Appendix J1 to Subpart B of Part 430) (2008)
Commercial clothes washers	10 CFR Section 430.23(j) (Appendix J1 to Subpart B of Part 430) (2008)

Table R Cooking Product and Food Service Equipment Test Methods

Appliance	Test Method
Cooking products that are consumer products	10 CFR Section 430.23(i) (Appendix I to Subpart B of Part 430) (2008)
Commercial hot food holding cabinets	ANSI/ASTM F2140-01 (Test for idle energy rate-dry test) and US EPA's Energy Star Guidelines, "Measuring Interior Volume" (Test for interior volume)
Commercial convection ovens	ANSI/ASTM F1496-99 (Test for energy input rate and idle energy consumption only)
Commercial range tops	ANSI/ASTM F1521-96 (Test for cooking energy efficiency only)

Table A-3 Standards for Non-Commercial Refrigerators, Refrigerator-Freezers, and Freezers Manufactured on or After July 1, 2001

Appliance	Maximum Energy Consumption (kWh/yr)
Refrigerators and Refrigerator-Freezers with manual defrost	8.82AV + 248.4
Refrigerator-Freezer – partial automatic defrost	8.82AV + 248.4
Refrigerator-Freezers – automatic defrost with top-mounted freezer without through-the-door ice service and all refrigerators – automatic defrost	9.80AV + 276.0
Refrigerator-Freezers – automatic defrost with side-mounted freezer without through-the-door ice service	4.91 AV + 507.5
Refrigerator-Freezers – automatic defrost with bottom-mounted freezer	4.60AV + 459.0
Refrigerator-Freezers – automatic defrost with top-mounted freezer with through-the-door ice service	10.20AV + 356.0
Refrigerator-Freezers – automatic defrost with side-mounted freezer with through-the-door ice service	10.10AV + 406.0
Upright Freezers with manual defrost	7.55AV + 258.3
Upright Freezers with automatic defrost	12.43AV + 326.1
Chest Freezers and all other Freezers except Compact Freezers	9.88AV + 143.7
Compact Refrigerators and Refrigerator-Freezers with manual defrost	10.70AV + 299.0
Compact Refrigerator-Freezers – partial automatic defrost	7.00AV + 398.0
Compact Refrigerator-Freezers – automatic defrost with top-mounted freezer and compact all refrigerators – automatic defrost	12.70AV + 355.0
Compact Refrigerator-Freezers – automatic defrost with side-mounted freezer	7.60AV + 501.0
Compact Refrigerator-Freezers – automatic defrost with bottom-mounted freezer	13.10AV + 367.0
Compact Upright Freezers with manual defrost	9.78AV + 250.8
Compact Upright Freezers with automatic defrost	11.40AV + 391.0
Compact Chest Freezers	10.45AV + 152.0
AV = adjusted total volume, expressed in ft ³ , as determined in 10 CFR, Part 430, Appendices A1 and B1 of Subpart B (2008), which is:	
[1.44 x freezer volume (ft ³)] + refrigerator volume (ft ³) for refrigerators;	
[1.63 x freezer volume (ft ³)] + refrigerator volume (ft ³) for refrigerator-freezers;	
[1.73 x freezer volume (ft ³)] for freezers.	
Note: Maximum energy consumption standards for refrigerator-freezers with internal freezers are same as those for refrigerator-freezers with top-mounted freezers.	

Table A-4 Standards for Commercial Refrigerators, Refrigerator-Freezers, and Freezers Manufactured on or After January 1, 2010

Appliance	Maximum Daily Energy Consumption (kWh)
Refrigerators with solid doors	0.10V + 2.04
Refrigerators with transparent doors	0.12V + 3.34
Freezers with solid doors	0.40V + 1.38
Freezers with transparent doors	0.75V + 4.10
Refrigerator/freezers with solid doors	the greater of 0.27AV–0.71 or 0.70
Refrigerators with self-condensing unit designed for pull-down temperature applications	0.126V + 3.51

**Table A-5 Standards for Automatic Commercial Ice Makers
Manufactured on or After January 1, 2010**

Equipment type	Type of cooling	Harvest rate (lbs ice/24 hours)	Maximum energy use (kWh/100 lbs ice)	Maximum condenser water use* (gal/100 lbs ice)
Ice Making Head	Water	< 500	7.80–0.0055H	200–0.022H.
Ice Making Head	Water	≥ 500 and < 1436	5.58–0.0011H	200–0.022H.
Ice Making Head	Water	≥ 1436	4.0	200–0.022H.
Ice Making Head	Air	< 450	10.26–0.0086H	Not applicable.
Ice Making Head	Air	≥ 450	6.89–0.0011H	Not applicable.
Remote Condensing (but not remote compressor)	Air	< 1000	8.85–0.0038H	Not applicable.
Remote Condensing (but not remote compressor)	Air	≥ 1000	5.1	Not applicable.
Remote Condensing and Remote Compressor	Air	< 934	8.85–0.0038H	Not applicable.
Remote Condensing and Remote Compressor	Air	≥ 934	5.3	Not applicable.
Self Contained	Water	< 200	11.40–0.019H	191–0.0315H.
Self Contained	Water	≥ 200	7.6	191–0.0315H.
Self Contained	Air	< 175	18.0–0.0469H	Not applicable.
Self Contained	Air	≥ 175	9.8	Not applicable.

H Harvest rate in pounds per 24 hours.

*Water use is for the condenser only and does not include potable water used to make ice.

Table B-2 Standards for Room Air Conditioners and Room Air-Conditioning Heat Pumps

Appliance	Louvered Sides	Cooling Capacity (Btu/hr)	Minimum EER
Room Air Conditioner	Yes	< 6,000	9.7
Room Air Conditioner	Yes	≥ 6,000 – 7,999	9.7
Room Air Conditioner	Yes	≥ 8,000 – 13,999	9.8
Room Air Conditioner	Yes	≥ 14,000 – 19,999	9.7
Room Air Conditioner	Yes	≥ 20,000	8.5
Room Air Conditioner	No	< 6,000	9.0
Room Air Conditioner	No	≥ 6,000 – 7,999	9.0
Room Air Conditioner	No	≥ 8,000 – 19,999	8.5
Room Air Conditioner	No	≥ 20,000	8.5
Room Air Conditioning Heat Pump	Yes	< 20,000	9.0
Room Air Conditioning Heat Pump	Yes	≥ 20,000	8.5
Room Air Conditioning Heat Pump	No	< 14,000	8.5
Room Air Conditioning Heat Pump	No	≥ 14,000	8.0
Casement-Only Room Air Conditioner	Either	Any	8.7
Casement-Slider Room Air Conditioner	Either	Any	9.5

Table B-3 Standards for Packaged Terminal Air Conditioners and Packaged Terminal Heat Pumps

Appliance	Mode	Cooling Capacity (Btu/hr)	Minimum EER or COP
Packaged terminal air conditioners and packaged terminal heat pumps	Cooling	≤ 7,000	8.88 EER
		> 7,000 and < 15,000	10.0 – (0.00016 x Cap.) EER
		≥ 15,000	7.6 EER
Packaged terminal heat pumps	Heating	Any	1.3 + [0.16 (10.0 – 0.00016 x Cap.)] COP
Cap. = cooling capacity (Btu/hr)			

**Table C-2 Standards for Single Phase Air-Cooled Air Conditioners with
Cooling Capacity Less than 65,000 Btu per Hour and Single Phase Air-Source Heat
Pumps with Cooling Capacity Less than 65,000 Btu per Hour, Not Subject to EPAct**

Appliance	Minimum Efficiency			
	Effective January 1, 1995		Effective January 23, 2006	
	Minimum SEER	Minimum HSPF	Minimum SEER	Minimum HSPF
Split system air conditioners	10.0	—	13.0	—
Split system heat pumps	10.0	6.8	13.0	7.7
Single package air conditioners	9.7	—	13.0	—
Single package heat pumps	9.7	6.6	13.0	7.7
Space constrained air conditioners – split system	10.0	—	12.0	—
Space constrained heat pumps – split system	10.0	6.8	12.0	7.4
Space constrained air conditioners – single package	9.7	—	12.0	—
Space constrained heat pumps – single package	9.7	6.6	12.0	7.4
Through-the-wall air conditioners – split system ¹	—	—	10.9	—
Through-the-wall heat pumps – split system ¹	—	—	10.9	7.1
Through-the-wall air conditioners – single package ¹	—	—	10.6	—
Through-the-wall heat pumps – single package ¹	—	—	10.6	7.0
Small duct, high velocity air conditioner systems	—	—	13.0	—
Small duct, high velocity heat pump systems	—	—	13.0	7.7

¹ This product class applies to models manufactured prior to January 23, 2010.

**Table C-3 Standards for Air-Cooled Air Conditioners and Air-Source Heat Pumps Subject to EPAct
(Standards Effective January 1, 2010 do not apply To Single Package Vertical Air Conditioners)**

Appliance	Cooling Capacity (Btu/hr)	System Type	Minimum Efficiency			
			Effective January 1, 1994 ¹ or January 1, 1995 ²	Effective June 15, 2008	Effective January 1, 2010	
					Air Conditioners	Heat Pumps
Air-cooled unitary air conditioners and heat pumps (cooling mode)	< 65,000 *	Split system	10.0 SEER ¹	13.0 SEER	-----	-----
	< 65,000 *	Single package	9.7 SEER ¹	13.0 SEER	-----	-----
	≥ 65,000 and < 135,000	All	8.9 EER ¹	-----	11.2 EER ³ 11.0 EER ⁴	11.0 EER ³ 10.8 EER ⁴
	≥ 135,000 and < 240,000	All	8.5 EER ²	-----	11.0 EER ³ 10.8 EER ⁴	10.6 EER ³ 10.4 EER ⁴
	≥ 240,000 and < 760,000	All	-----	-----	10.0 EER ³ 9.8 EER ⁴	9.5 EER ³ 9.3 EER ⁴
Air-cooled unitary air-conditioning heat pumps (heating mode)	< 65,000 *	Split system	6.8 HSPF ¹	7.7 HSPF	-----	
	< 65,000 *	Single package	6.6 HSPF ¹	7.7 HSPF	-----	
	≥ 65,000 and < 135,000	All	3.0 COP ¹	-----	3.3 COP	
	≥ 135,000 and < 240,000	All	2.9 COP ²	-----	3.2 COP	
	≥ 240,000 and < 760,000	All	-----	-----	3.2 COP	

* Three phase models only.

³ Applies to equipment that has electric resistance heat or no heating.

⁴ Applies to equipment with all other heating-system types that are integrated into the unitary equipment.

Table C-4 Standards for Evaporatively-Cooled Air Conditioners

<i>Appliance</i>	<i>Cooling Capacity (Btu per hour)</i>	<i>Minimum EER</i>	
		<i>Effective October 29, 2003</i>	<i>Effective October 29, 2004</i>
Evaporatively-cooled air conditioners	< 65,000	12.1	12.1
	≥ 65,000 and < 135,000	11.5 ¹	11.5 ¹
	≥ 135,000 < 240,000	9.6	11.0

¹ Deduct 0.2 from the required EER for units with heating sections other than electric resistance heat.

Table C-5 Standards for Water-Cooled Air Conditioners and Water-Source Heat Pumps

<i>Appliance</i>	<i>Cooling Capacity (Btu per hour)</i>	<i>Minimum Efficiency</i>			
		<i>Effective October 29, 2003</i>		<i>Effective October 29, 2004</i>	
		<i>Minimum EER</i>	<i>COP</i>	<i>Minimum EER</i>	<i>COP</i>
Water-cooled air conditioners	< 17,000	12.1	—	12.1	—
Water-source heat pumps	< 17,000	11.2	4.2	11.2	4.2
Water-cooled air conditioners	≥ 17,000 and < 65,000	12.1	—	12.1	—
Water-source heat pumps	≥ 17,000 and < 65,000	12.0	4.2	12.0	4.2
Water-cooled air conditioners	≥ 65,000 and < 135,000	11.5 ¹	—	11.5	—
Water-source heat pumps	≥ 65,000 and < 135,000	12.0	4.2	12.0	4.2
Water-cooled air conditioners	≥ 135,000 and < 240,000	9.6	—	11.0	—
Water-source heat pumps	≥ 135,000 and < 240,000	9.6	2.9	9.6	2.9

¹ Deduct 0.2 from the required EER for units with heating sections other than electric resistance heat.

Table C-6 Standards for Single Package Vertical Air Conditioners and Single Package Vertical Heat Pumps Manufactured on or After January 1, 2010

Appliance	Cooling Capacity (BTU/hr)	System Type	Minimum Efficiency	
			Cooling Mode	Heating Mode
Single package vertical air conditioners	< 65,000	Single-phase	9.0 EER	N/A
	< 65,000	3-phase	9.0 EER	N/A
	≥ 65,000 and < 135,000	All	8.9 EER	N/A
	≥ 135,000 and < 240,000	All	8.6 EER	N/A
Single package vertical heat pumps	< 65,000	Single-phase	9.0 EER	3.0 COP
	< 65,000	3-phase	9.0 EER	3.0 COP
	≥ 65,000 and < 135,000	All	8.9 EER	3.0 COP
	≥ 135,000 and < 240,000	All	8.6 EER	2.9 COP

Table D-2 Standards for Dehumidifiers

Product capacity (pint/day)	Minimum energy factor (liters/kWh)	
	Effective October 1, 2007	Effective October 1, 2012
25.00 or less	1.00	1.35
25.01 – 35.00	1.20	1.35
35.01 – 45.00	1.30	1.50
45.01 – 54.00	1.30	1.60
54.01 – 74.99	1.50	1.70
75.00 or more	2.25	2.50

Table E-2 Standards for Gas Wall Furnaces, Floor Furnaces, and Room Heaters

Appliance	Design Type	Capacity (Btu per hour)	Minimum AFUE (%)	
Wall furnace	Fan	≤ 42,000	73	
Wall furnace	Fan	> 42,000	74	
Wall furnace	Gravity	≤ 10,000	59	
Wall furnace	Gravity	> 10,000	≤ 12,000	60
Wall furnace	Gravity	> 12,000	≤ 15,000	61
Wall furnace	Gravity	> 15,000	≤ 19,000	62
Wall furnace	Gravity	> 19,000	≤ 27,000	63
Wall furnace	Gravity	> 27,000	≤ 46,000	64
Wall furnace	Gravity	> 46,000	65	
Floor furnace	All	≤ 37,000	56	
Floor furnace	All	> 37,000	57	
Room heater	All	≤ 18,000	57	
Room heater	All	> 18,000 and ≤ 20,000	58	
Room heater	All	> 20,000 and ≤ 27,000	63	
Room heater	All	> 27,000 and ≤ 46,000	64	
Room heater	All	> 46,000	65	

Table E-3 Standards for Gas- and Oil-Fired Central Boilers and Electric Residential Boilers

Appliance	Rated Input (Btu/hr)	Minimum Efficiency (%)			Combustion Efficiency at Maximum Rated Capacity Effective January 1, 1994	
		AFUE		Effective January 1, 1992		
		Effective	January 1, 1992			
Gas steam boilers with single phase electrical supply	< 300,000	75	80 ¹	—	—	
Gas hot water boilers with single phase electrical supply	< 300,000	80	82 ^{1,2}	—	—	
Oil steam boilers with single phase electrical supply	< 300,000	—	82	—	—	
Oil hot water boilers with single phase electrical supply	< 300,000	—	84 ²	—	—	
Electric steam residential boilers		—	NONE	—	—	
Electric hot water residential boilers		—	NONE ²	—	—	
All other boilers with single phase electrical supply	< 300,000	80	—	—	—	
Gas packaged boilers	≥ 300,000	—	—	—	80	
Oil packaged boilers	≥ 300,000	—	—	—	83	

¹ No constant burning pilot light design standard effective September 1, 2012.² Automatic means for adjusting temperature design standard effective September 1, 2012.

Table E-4 Standards for Gas- and Oil-Fired Central Furnaces

Appliance	Rated Input (Btu/hr)	Minimum Efficiency (%)	
		AFUE	Thermal Efficiency
Mobile home gas and oil central furnaces with single phase electrical supply	< 225,000	75	—
All other gas and oil central furnaces with single phase electrical supply	< 225,000	78	—
Gas central furnaces	≥ 225,000	—	80
Oil central furnaces	≥ 225,000	—	81

Table F-3 Standards for Large Water Heaters Effective October 29, 2003

Appliance	Input to Volume Ratio	Size (Volume)	Minimum Thermal Efficiency (%)	Maximum Standby Loss^{1,2}
Gas storage water heaters	< 4,000 Btu/hr/gal	any	80	$Q/800 + 110(V_r)^{1/2}$ Btu/hr
Gas instantaneous water heaters	≥ 4,000 Btu/hr/gal	< 10 gal	80	—
		≥ 10 gal	80	$Q/800 + 110(V_r)^{1/2}$ Btu/hr
Gas hot water supply boilers	≥ 4,000 Btu/hr/gal	< 10 gal	80	—
		≥ 10 gal	80	$Q/800 + 110(V_r)^{1/2}$ Btu/hr
Oil storage water heaters	< 4,000 Btu/hr/gal	any	78	$Q/800 + 110(V_r)^{1/2}$ Btu/hr
Oil instantaneous water heaters	≥ 4,000 Btu/hr/gal	< 10 gal	80	—
		≥ 10 gal	78	$Q/800 + 110(V_r)^{1/2}$ Btu/hr
Oil hot water supply boilers	≥ 4,000 Btu/hr/gal	< 10 gal	80	—
		≥ 10 gal	78	$Q/800 + 110(V_r)^{1/2}$ Btu/hr
Electric storage water heaters	< 4,000 Btu/hr/gal	any	—	$0.3 + 27/V_m$ %/hr

¹ Standby loss is based on a 70° F temperature difference between stored water and ambient requirements. In the standby loss equations, V_r is the rated volume in gallons, V_m is the measured volume in gallons, and Q is the nameplate input rate in Btu/hr.

² Water heaters and hot water supply boilers having more than 140 gallons of storage capacity are not required to meet the standby loss requirement if the tank surface is thermally insulated to R-12.5, if a standing pilot light is not installed, and for gas- or oil-fired storage water heaters, there is a flue damper or fan-assisted combustion.

Table F-4 Standards for Small Federally-Regulated Water Heaters

Appliance	Minimum Energy Factor	
	Effective April 15, 1991	Effective January 20, 2004
Gas-fired storage-type water heaters	0.62 – (.0019 x V)	0.67 – (.0019 x V)
Oil-fired water heaters (storage and instantaneous)	0.59 – (.0019 x V)	0.59 – (.0019 x V)
Electric storage water heaters (excluding tabletop water heaters)	0.93 – (.00132 x V)	0.97 – (.00132 x V)
Electric tabletop water heaters	0.93 – (.00132 x V)	0.93 – (.00132 x V)
Gas-fired instantaneous water heaters	0.62 – (.0019 x V)	0.62 – (.0019 x V)
Electric instantaneous water heaters (excluding tabletop water heaters)	0.93 – (.00132 x V)	0.93 – (.00132 x V)
Heat pump water heaters	0.93 – (.00132 x V)	0.97 – (.00132 x V)

V = rated volume in gallons.

Table H-1 Standards for Plumbing Fittings

Appliance	Maximum Flow Rate
Showerheads	2.5 gpm at 80 psi
Lavatory faucets	2.2 gpm at 60 psi
Kitchen faucets	2.2 gpm at 60 psi
Replacement aerators	2.2 gpm at 60 psi
Wash fountains	$2.2 \times \frac{\text{rim space (inches)}}{20} \text{ gpm at 60 psi}$
Metering faucets	0.25 gallons/cycle
Metering faucets for wash fountains	$0.25 \times \frac{\text{rim space (inches)}}{20} \text{ gpm at 60 psi}$

Table I Standards for Plumbing Fixtures

<i>Appliance</i>	<i>Maximum Gallons per Flush</i>
Gravity tank-type water closets	1.6
Flushometer tank water closets	1.6
Electromechanical hydraulic water closets	1.6
Blowout water closets	3.5
Trough-type urinals	trough length (inches) 16
Other urinals	1.0

Table J-1 Standards for Fluorescent Lamp Ballasts and Replacement Fluorescent Lamp Ballasts

<i>Application for Operation of</i>	<i>Ballast Input Voltage</i>	<i>Total Nominal Lamp Watts</i>	<i>Minimum Ballast Efficacy Factor</i>	
one F40T12 lamp	120 or 277	40	2.29 ¹	1.805 ²
two F40T12 lamps	120	80	1.17 ¹	1.060 ²
	277	80	1.17 ¹	1.050 ²
two F96T12 lamps	120 or 277	150	0.63 ¹	0.570 ²
two F96T12HO lamps	120 or 277	220	0.39 ¹	0.390 ²

¹ For fluorescent lamp ballasts manufactured on or after April 1, 2005; sold by the manufacturer on or after July 1, 2005; or incorporated into a luminaire by a luminaire manufacturer on or after April 1, 2006.

² For fluorescent lamp ballasts designed, marked, and shipped as replacement ballasts.

**Table J-2
Standards for Fluorescent Lamp Ballasts¹**

<i>Application for Operation of</i>	<i>Ballast Input Voltage</i>	<i>Total Nominal Lamp Watts</i>	<i>Minimum Ballast Efficacy Factor</i>
one F34T12 lamp	120 or 277	34	2.61
two F34T12 lamps	120 or 277	68	1.35
two F96T12/ES lamps	120 or 277	120	0.77
two F96T12HO/ES lamps	120 or 277	190	0.42

¹ For fluorescent lamp ballasts manufactured on or after July 1, 2009; sold by the manufacturer on or after October 1, 2009; or fluorescent lamp ballasts incorporated into a luminaire by a luminaire manufacturer on or after July 1, 2010.

Table K-1
Standards for Federally-Regulated General Service Fluorescent Lamps

Appliance	Nominal Lamp Wattage	Minimum Color Rendering Index (CRI)	Minimum Average Lamp Efficacy (LPW)
4-foot medium bi-pin lamps	> 35	69	75.0
	≤ 35	45	75.0
2-foot U-shaped lamps	> 35	69	68.0
	≤ 35	45	64.0
8-foot slimline lamps	> 65	69	80.0
	≤ 65	45	80.0
8-foot high output lamps	> 100	69	80.0
	≤ 100	45	80.0

Table K-2
Standards for Federally-Regulated Incandescent Reflector Lamps

Nominal Lamp Wattage	Minimum Average Lamp Efficacy (LPW)
40-50	10.5
51-66	11.0
67-85	12.5
86-115	14.0
116-155	14.5
156-205	15.0

Table K-3
Standards for Medium Base Compact Fluorescent Lamps

Factor	Requirements
<i>Lamp Power (Watts) and Configuration¹</i>	<i>Minimum Efficacy: lumens/watt (Based upon initial lumen data)²</i>
<i>Bare Lamp:</i> Lamp Power < 15 Lamp Power ≥ 15	45.0 60.0
<i>Covered Lamp (no reflector)</i> Lamp Power < 15 15 ≥ Lamp Power < 19 19 ≥ Lamp Power < 25 Lamp Power ≥ 25	40.0 48.0 50.0 55.0
1,000-hour Lumen Maintenance	The average of at least 5 lamps must be a minimum 90% of initial (100-hour) lumen output @ 1,000 hours of rated life.
Lumen Maintenance	80% of initial (100-hour) rating at 40 percent of rated life (per ANSI C78.5 Clause 4.10).
Rapid Cycle Stress Test	Per ANSI C78.5 and IESNA LM-65 (Clauses 2, 3, 5, and 6) <i>Exception:</i> Cycle times must be 5 minutes on, 5 minutes off. Lamp will be cycled once for every two hours of rated life. At least 5 lamps <i>must meet or exceed</i> the minimum number of cycles.
Average Rated Lamp Life	≥ 6,000 hours as declared by the manufacturer on the packaging. 80% of rated life, statistical methods may be used to confirm lifetime claims based on sampling performance.
¹ Take performance and electrical requirements at the end of the 100-hour aging period according to ANSI Standard C78.5. The lamp efficacy shall be the average of the lesser of the lumens per watt measured in the base up and/or other specified positions. Use wattages placed on packaging to select proper specification efficacy in this table, not measured wattage. Labeled wattages are for reference only.	
² Efficacies are based on measured values for lumens and wattages from pertinent test data. Wattages and lumens placed on packages may not be used in calculation and are not governed by this specification. For multi-level or dimmable systems, measurements shall be at the highest setting. Acceptable measurement error is ±3%.	

Table K-4 Standards for Federally-Regulated General Service Incandescent Lamps

Rated Lumen Ranges	Maximum Rate Wattage	Minimum Rate Lifetime	Effective Date
1490-2600	72	1,000 hours	January 1, 2012
1050 – 1489	53	1,000 hours	January 1, 2013
750 – 1049	43	1,000 hours	January 1, 2014
310 – 749	29	1,000 hours	January 1, 2014

Table K-5 Standards for Federally-Regulated Modified Spectrum General Service Incandescent Lamps

Rated Lumen Ranges	Maximum Rate Wattage	Minimum Rate Lifetime	Effective Date
1118-1950	72	1,000 hours	January 1, 2012
788-1117	53	1,000 hours	January 1, 2013
563-787	43	1,000 hours	January 1, 2014
232-562	29	1,000 hours	January 1, 2014

Table K-6 Standards for Federally Regulated Candelabra Base Incandescent Lamps and Intermediate Base Incandescent Lamps

Lamp Base Type	Maximum Rated Wattage
Candelabra	60
Intermediate	40

Table M-1 Standards for Traffic Signals for Vehicle and Pedestrian Control

Appliance	Maximum Wattage (at 74°C)	Nominal Wattage (at 25°C)
Traffic Signal Module Type:		
12-inch; Red Ball	17	11
8-inch; Red Ball	13	8
12-inch; Red Arrow	12	9
12-inch; Green Ball	15	15
8-inch; Green Ball	12	12
12-inch; Green Arrow	11	11
Pedestrian Module Type:		
Combination Walking Man/Hand	16	13
Walking Man	12	9
Orange Hand	16	13

Table O Standards for Dishwashers

Appliance	Effective May 14, 1994	Effective January 1, 2010	
	Minimum Energy Factor (cycles/kWh)	Maximum Energy Use (kWh/year)	Maximum Water Use (gallons/cycle)
Compact dishwashers	0.62	260	4.5
Standard dishwashers	0.46	355	6.5

Table P-2 Energy Efficiency Standards for Residential Clothes Washers

Appliance	Minimum Modified Energy Factor Effective January 1, 2007	Maximum Water Factor Effective January 1, 2011
Top-loading compact clothes washers	0.65	--
Top-loading standard clothes washers	1.26	9.5
Top-loading, semi-automatic	N/A ¹	--
Front-loading clothes washers	1.26	9.5
Suds-saving	N/A ¹	--

¹ Must have an unheated rinse water option.

Table Q Standards for Clothes Dryers

Appliance	Minimum Energy Factor (lbs/kWh)
Electric, standard clothes dryers	3.01
Electric, compact, 120 volt clothes dryers	3.13
Electric, compact, 240 volt clothes dryers	2.90
Gas clothes dryers	2.67

Table S-1 Standards for Electric Motors

Motor Horsepower/Standard Kilowatt Equivalent	Minimum Nominal Full-Load Efficiency					
	Open Motors			Closed Motors		
	6 poles	4 poles	2 poles	6 poles	4 poles	2 poles
1/0.75	80.0	82.5	...	80.0	82.5	75.5
1.5/1.1	84.0	84.0	82.5	85.5	84.0	82.5
2/1.5	85.5	84.0	84.0	86.5	84.0	84.0
3/2.2	86.5	86.5	84.0	87.5	87.5	85.5
5/3.7	87.5	87.5	85.5	87.5	87.5	87.5
7.5/5.5	88.5	88.5	87.5	89.5	89.5	88.5
10/7.5	90.2	89.5	88.5	89.5	89.5	89.5
15/11	90.2	91.0	89.5	90.2	91.0	90.2
20/15	91.0	91.0	90.2	90.2	91.0	90.2
25/18.5	91.7	91.7	91.0	91.7	92.4	91.0
30/22	92.4	92.4	91.0	91.7	92.4	91.0
40/30	93.0	93.0	91.7	93.0	93.0	91.7
50/37	93.0	93.0	92.4	93.0	93.0	92.4
60/45	93.6	93.6	93.0	93.6	93.6	93.0
75/55	93.6	94.1	93.0	93.6	94.1	93.0
100/75	94.1	94.1	93.0	94.1	94.5	93.6
125/90	94.1	94.5	93.6	94.1	94.5	94.5
150/110	94.5	95.0	93.6	95.0	95.0	94.5
200/150	94.5	95.0	94.5	95.0	95.0	95.0

Table S-2 Standards for Electric Motors Manufactured on or After December 19, 2010

Appliance	Horsepower	Minimum Nominal Full-Load Efficiency (as referenced in NEMA MG-1 (2006) Table):
General purpose electric motors (subtype I)	$\geq 1 < 200$	Table 12-12
Fire Pump Motors	All	Table 12-11
General purpose electric motors (subtype II)	$\geq 1 < 200$	Table 12-11
NEMA Design B, general purpose electric motors	$> 200 \leq$	Table 12-11

Table T-3 Standards for Low-Voltage Dry-Type Distribution Transformers

Single phase		Three phase	
kVA	Efficiency (%)¹	kVA	Efficiency (%)¹
15	97.7	15	97.0
25	98.0	30	97.5
37.5	98.2	45	97.7
50	98.3	75	98.0
75	98.5	112.5	98.2
100	98.6	150	98.3
167	98.7	225	98.5
250	98.8	300	98.6
333	98.9	500	98.7
		750	98.8
		1000	98.9

¹ Efficiencies are determined at the following reference conditions:

(1) for no-load losses, at the temperature of 20°C, and (2) for load-losses, at the temperature of 75°C and 35 percent of nameplate load.

(Source: Table 4-2 of NEMA Standard TP-1-2002, "Guide for Determining Energy Efficiency for Distribution Transformers.")

Table T-4 Standards for Liquid-Immersed Distribution Transformers

Single phase		Three phase	
kVA	Efficiency (%) ¹	kVA	Efficiency (%) ¹
10	98.62	15	98.36
15	98.76	30	98.62
25	98.91	45	98.76
37.5	99.01	75	98.91
50	99.08	112.5	99.01
75	99.17	150	99.08
100	99.23	225	99.17
167	99.25	300	99.23
250	99.32	500	99.25
333	99.36	750	99.32
500	99.42	1000	99.36
667	99.46	1500	99.42
833	99.49	2000	99.46
		2500	99.49

¹ Note: All efficiency values are at 50 percent of nameplate-rated load, determined when tested according to the test procedure in Section 1604(t).

Table T-5 Standards for Medium-Voltage Dry-Type Distribution Transformers

Single phase				Three phase			
BIL kVA	20-45 kV Efficiency ¹ (%)	46-95 kV efficiency ¹ (%)	≥ 96 kV efficiency ¹ (%)	BIL kVA	20-45 kV Efficiency ¹ (%)	46-95 kV efficiency ¹ (%)	≥ 96 kV efficiency ¹ (%)
15	98.10	97.86	—	15	97.50	97.18	—
25	98.33	98.12	—	30	97.90	97.63	—
37.5	98.49	98.30	—	45	98.10	97.86	—
50	98.60	98.42	—	75	98.33	98.12	—
75	98.73	98.57	98.53	112.5	98.49	98.30	—
100	98.82	98.67	98.63	150	98.60	98.42	—
167	98.96	98.83	98.80	225	98.73	98.57	98.53
250	99.07	98.95	98.91	300	98.82	98.67	98.63
333	99.14	99.03	98.99	500	98.96	98.83	98.80
500	99.22	99.12	99.09	750	99.07	98.95	98.91
667	99.27	99.18	99.15	1000	99.14	99.03	98.99
833	99.31	99.23	99.20	1500	99.22	99.12	99.09
				2000	99.27	99.18	99.15
				2500	99.31	99.23	99.20

¹ All efficiency values are at 50 percent of nameplate rated load, determined when tested according to the test procedure in Section 1604(t).

Table U-1 Standards for Class A External Power Supplies That are Federally Regulated

Nameplate Output	Minimum Efficiency in Active Mode (Decimal equivalent of a Percentage)
< 1 watt	0.5 * Nameplate Output
≥ 1 and ≤ 51 watts	0.09* $\ln(\text{Nameplate Output}) + 0.5$
> 51 watts	0.85
Maximum Energy Consumption in No-Load Mode	
≤ 250 watts	0.5 watts

Where \ln (Nameplate Output) = Natural Logarithm of the nameplate output expressed in watts.

Table C-7 Standards for Air-Cooled Air Conditioners and Air-Source Heat Pumps

Appliance	Cooling Capacity (Btu/hr)	Minimum Standards	
		—	Effective on the effective date of the US DOE waiver from preemption, should such a waiver be granted
Single package air-cooled air conditioners	< 65,000	—	11.0 EER 13.0 SEER
Other air-cooled air conditioners	< 65,000	—	11.6 EER 13.0 SEER
Single package air-cooled heat pumps	< 65,000	—	11.0 EER 13.0 SEER 7.7 HSPF
Other air-cooled heat pumps	< 65,000	—	11.6 EER 13.0 SEER 7.9 HSPF
Air-cooled air conditioners	≥ 65,000 and < 135,000	—	11.0 EER
Air-source heat pumps	≥ 65,000 and < 135,000	—	11.0 EER 3.4 at 47°F. COP 2.4 at 17°F. COP
Air-cooled air conditioners	≥ 135,000 and < 240,000	—	10.8 EER
Air-source heat pumps	≥ 135,000 and < 240,000	—	10.8 EER 3.3 at 47°F. COP 2.2 at 17°F. COP

Table P-3 Water Efficiency Standards for Clothes Washers

<i>Appliance</i>	<i>Maximum Water Factor (Gallons/cubic foot)</i>	
	<i>Effective January 1, 2007</i>	<i>Effective January 1, 2010</i>
Top-loading clothes washers	8.5	6.0
Front-loading clothes washers	8.5	6.0

Table A-6 Standards for Wine Chillers

<i>Appliance</i>	<i>Maximum Annual Energy Consumption (kWh)</i>
Wine chillers with manual defrost	13.7V + 267
Wine chillers with automatic defrost	17.4V + 344
V = volume in ft ³ .	

Table A-7 Standards for Freezers that are Consumer Products

<i>Appliance</i>	<i>Maximum Annual Energy Consumption (kWh)</i>
Upright Freezers with manual defrost	7.55AV + 258.3
Upright Freezers with automatic defrost	12.43AV + 326.1
Chest Freezers	9.88AV + 143.7
AV = adjusted total volume, expressed in ft ³ , which is 1.73 x freezer volume (ft ³).	

Table A-8 Energy Design Standards for Walk-In Coolers and Walk-In Freezers Manufactured Before January 1, 2009

Motor Type	Effective Date	Required Components
All	January 1, 2006	Automatic door closers that firmly close all reach-in doors
All	January 1, 2006	Automatic door closers on all doors no wider than four foot or higher than seven foot, that firmly close walk-in doors that have been closed to within one inch of full closure
All	January 1, 2006	Envelope insulation > R-28 for Refrigerators
All	January 1, 2006	Envelope insulation > R-36 for Freezers
Condenser Fan Motors < 1 HP	January 1, 2006	(i) Electronically commutated motors, (ii) permanent split capacitor-type motors, (iii) polyphase motors > $\frac{1}{2}$ HP, or (iv) motors of equivalent efficiency as determined by the Executive Director
Single-phase Evaporator Fan Motors < 1 HP and < 460 volts	January 1, 2006	(i) Electronically commutated motors or (ii) permanent split capacitor-type motors
Single-phase Evaporator Fan Motors < 1 HP and < 460 volts	January 1, 2008	Electronically commutated motors

Table A-9 Standards for Reach-In Cabinets, Pass-Through Cabinets, Roll-In or Roll-Through Cabinets Manufactured Prior to January 1, 2010, and Wine Chillers that are Not Consumer Products

Appliance	Doors	Maximum Daily Energy Consumption(kWh)			
		March 1, 2003	August 1, 2004	January 1, 2006	January 1, 2007
Reach-in cabinets, pass-through cabinets, and roll-in or roll-through cabinets that are refrigerators; and wine chillers that are not consumer products	Solid	0.125V + 4.22	0.125V + 2.76	0.10V + 2.04	0.10V + 2.04
	Transparent	0.172V + 5.78	0.172V + 4.77	0.172V + 4.77	0.12V + 3.34
Reach-in cabinets, pass-through cabinets, and roll-in or roll-through cabinets that are freezers (except ice cream freezers)	Solid	0.398V + 2.83	0.398V + 2.28	0.40V + 1.38	0.40V + 1.38
	Transparent	0.940V + 5.10	0.940V + 5.10	0.940V + 5.10	0.75V + 4.10
Reach-in cabinets, pass-through cabinets, and roll-in or roll-through cabinets that are freezers that are ice cream freezers	Solid	0.398V + 2.83	0.398V + 2.28	0.398V + 2.28	0.39V + 0.82
	Transparent	0.940V + 5.10	0.940V + 5.10	0.940V + 5.10	0.88V + 0.33
Reach-in cabinets that are refrigerator-freezers and that have an adjusted volume (AV) of 5.19 ft ³ or greater	Solid	0.273AV + 2.63	0.273AV + 1.65	0.273AV + 1.65	0.27AV – 0.71
Reach-in cabinets that are refrigerator-freezers and that have an adjusted volume (AV) of less than 5.19 ft ³	Solid or Transparent	-----	-----	0.70	0.70

Table A-10 Standards for Refrigerated Canned and Bottled Beverage Vending Machines

Appliance	Doors	Maximum Daily Energy Consumption (kWh)	
		January 1, 2006	January 1, 2007
Refrigerated canned and bottled beverage vending machines when tested at 90° F ambient temperature except multi-package units	Not applicable	0.55(8.66 + (0.009 × C))	0.55(8.66 + (0.009 × C))
Refrigerated multi-package canned and bottled beverage vending machines when tested at 75° F ambient temperature	Not applicable	0.55(8.66 + (0.009 × C))	0.55(8.66 + (0.009 × C))
<p>V = total volume (ft³) AV = Adjusted Volume = [1.63 x freezer volume (ft³)] + refrigerator volume (ft³) C=Rated capacity (number of 12 ounce cans)</p>			

Table A-11 Standards for Automatic Commercial Ice-Makers

Equipment Type	Type of Cooling	Harvest Rate (lbs ice/24 hrs)	Maximum Energy Use (kWh/100 lbs. Ice)	Maximum Condenser Water Use (gallons/100 lbs. ice)
Ice-Making Head	Water	< 500	7.80 - .0055H	200 - .022H
		≥ 500 and < 1436	5.58 - .0011H	200 - .022H
		≥ 1436	4.0	200-.022H
Ice-Making Head	Air	< 450	10.26 - .0086H	Not Applicable
		≥ 450	6.89 - .0011H	Not Applicable
Remote-Condensing (but not remote compressor)	Air	< 1000	8.85 - .0038H	Not Applicable
		≥ 1000	5.10	Not Applicable
Remote-Condensing and Remote Compressor	Air	< 934	8.85 - .0038H	Not Applicable
		≥ 934	5.3	Not Applicable
Self-Contained	Water	< 200	11.40 - .0190H	191 - .0315H
		≥ 200	7.60	191 - .0315H
Self-Contained	Air	< 175	18.0 - .0469H	Not Applicable
		≥ 175	9.80	Not Applicable
<p>H = harvest rate in pounds per 24 hours, which shall be reported within 5% of the tested value. Water use is for the condenser only and does not include potable water used to make ice.</p>				

Table C-8 Standards for Ground Water-Source and Ground-Source Heat Pumps

Appliance	Rating Condition	Minimum Standard
Ground water-source heat pumps (cooling)	59°F entering water temperature	16.2 EER
Ground water-source heat pumps (heating)	50°F entering water temperature	3.6 COP
Ground-source heat pumps (cooling)	77°F entering brine temperature	13.4 EER
Ground-source heat pumps (heating)	32°F entering brine temperature	3.1 COP

Table C-9 Standards for Air-Cooled Computer Room Air Conditioners

Appliance	Cooling Capacity (Btu/hr)	Minimum EER (Btu/watt-hour)			
		Effective January 1, 1988	Effective March 1, 2003	Effective January 1, 2004	Effective January 1, 2006
Air-cooled computer room air conditioners	< 65,000	8.3	9.3	10.7	11.0
	≥ 65,000 and <135,000	7.7	8.3	10.4	10.4
	≥ 135,000 and < 240,000	—	7.9	10.2	10.2

Table C-10 Standards for Water-Cooled, Glycol-Cooled, and Evaporatively-Cooled Computer Room Air Conditioners

Appliance	Cooling Capacity (Btu/hr)	Minimum EER (Btu/watt-hour)			
		Effective January 1, 1988	Effective March 1, 2003	Effective October 29, 2004	Effective October 29, 2006
Water-cooled, glycol-cooled, and evaporatively-cooled computer room air conditioners	< 65,000	8.1	8.3	11.1	11.1
	≥ 65,000 and <135,000	8.4	9.5	10.5	10.5
	≥ 135,000 and < 240,000	—	8.6	8.6	10.0

Table E-5 Standards for Boilers

Appliance	Output (Btu/hr)	Standards		
		Minimum AFUE %	Minimum Combustion Efficiency % *	Maximum Standby Loss (watts)
Gas steam boilers with 3-phase electrical supply	< 300,000	75	—	—
All other boilers with 3-phase electrical supply	< 300,000	80	—	—
Natural gas, non-packaged boilers	≥ 300,000	—	80	147
LPG Non-packaged boilers	≥ 300,000	—	80	352
Oil, non-packaged boilers	≥ 300,000	—	83	—

*At both maximum and minimum rated capacity, as provided and allowed by the controls.

Table E-6 Standards for Furnaces

Appliance	Application	Minimum Efficiency %
Central furnaces with 3-phase electrical supply < 225,000 Btu/hour	Mobile Home	75 AFUE
	All others	78 AFUE or 80 Thermal Efficiency (at manufacturer's option)

Table E-7 Standards for Duct Furnaces

Appliance	Fuel	Standards		
		Minimum Thermal Efficiency %¹		Maximum Energy Consumption during standby (watts)
		At maximum rated capacity	At minimum rated capacity	
Duct furnaces	Natural gas	80	75	10
Duct furnaces	LPG ²	80	75	147

¹ As provided and allowed by the controls.

² Designed expressly for use with LPG.

Table E-8 Standards for Unit Heaters Manufactured Before August 8, 2008

Appliance	Fuel	Standards		
		Minimum Thermal Efficiency %¹		Maximum Energy Consumption during standby (watts)
		At maximum rated capacity	At minimum rated capacity	
Unit heaters	Natural gas	80	74	10
Unit heaters	LPG ²	80	74	147
Unit heaters	Oil	81	81	N/A

¹ As provided and allowed by the controls.
² Designed expressly for use with LPG.

Table F-5 Standards for Small Water Heaters that are Not Federally-Regulated Consumer Products

Appliance	Energy Source	Input Rating	Rated Storage Volume (gallons)	Minimum Energy Factor¹
Storage water heaters	Gas	$\leq 75,000 \text{ Btu/hr}$	< 20	$0.62 - (.0019 \times V)$
Storage water heaters	Gas	$\leq 75,000 \text{ Btu/hr}$	> 100	$0.62 - (.0019 \times V)$
Storage water heaters	Oil	$\leq 105,000 \text{ Btu/hr}$	> 50	$0.59 - (.0019 \times V)$
Storage water heaters	Electricity	$\leq 12 \text{ kW}$	> 120	$0.93 - (.00132 \times V)$
Instantaneous Water Heaters	Gas	$\leq 50,000 \text{ Btu/hr}$	Any	$0.62 - (.0019 \times V)$
Instantaneous Water Heaters	Gas	$\leq 200,000 \text{ Btu/hr}$	≥ 2	$0.62 - (.0019 \times V)$
Instantaneous Water Heaters	Oil	$\leq 210,000 \text{ Btu/hr}$	Any	$0.59 - (.0019 \times V)$
Instantaneous Water Heaters	Electricity	$\leq 12 \text{ kW}$	Any	$0.93 - (.00132 \times V)$

¹ Volume (V) = rated storage volume in gallons.

Table H-2 Standards for Tub Spout Diverters

Appliance	Testing Conditions	Maximum Leakage Rate
		Effective March 1, 2003
Tub spout diverters	When new	0.01 gpm
	After 15,000 cycles of diverting	0.05 gpm

Table K-7 Standards for State-Regulated General Service Incandescent Lamps

Frost or Clear		
	Maximum Power Use (watts)	
Lumens (L)	January 1, 2006	January 1, 2008
L < 340	(0.0500 * Lumens) + 21	(0.0500 * Lumens) + 21
340 ≤ L < 562	(0.0500 * Lumens) + 21	38
562 ≤ L < 610	(0.0500 * Lumens) + 21	(0.2400 * Lumens) – 97
610 ≤ L < 760	(0.0500 * Lumens) + 21	(0.0500 * Lumens) + 19
760 ≤ L < 950	(0.0500 * Lumens) + 21	57
950 ≤ L < 1013	(0.0500 * Lumens) + 21	(0.2000 * Lumens) – 133
1013 ≤ L < 1040	(0.0500 * Lumens) + 21	(0.0500 * Lumens) + 19
1040 ≤ L < 1300	(0.0500 * Lumens) + 21	71
1300 ≤ L < 1359	(0.0500 * Lumens) + 21	(0.2700 * Lumens) – 280
1359 ≤ L < 1520	(0.0500 * Lumens) + 21	(0.0500 * Lumens) + 19
1520 ≤ L < 1850	(0.0500 * Lumens) + 21	95
1850 ≤ L < 1900	(0.0500 * Lumens) + 21	(0.4200 * Lumens) - 682
L ≥ 1900	(0.0500 * Lumens) + 21	(0.0500 * Lumens) + 21

Soft White		
	Maximum Power Use (watts)	
Lumens (L)	January 1, 2006	January 1, 2008
L < 310	(0.0500 * Lumens) + 22.5	(0.0500 * Lumens) + 22.5
310 ≤ L < 514	(0.0500 * Lumens) + 22.5	38
514 ≤ L < 562	(0.0500 * Lumens) + 22.5	(0.2200 * Lumens) – 75
562 ≤ L < 730	(0.0500 * Lumens) + 22.5	(0.0500 * Lumens) + 20.5
730 ≤ L < 909	(0.0500 * Lumens) + 22.5	57
909 ≤ L < 963	(0.0500 * Lumens) + 22.5	(0.2200 * Lumens) – 143
963 ≤ L < 1010	(0.0500 * Lumens) + 22.5	(0.0500 * Lumens) + 20.5
1010 ≤ L < 1250	(0.0500 * Lumens) + 22.5	71
1250 ≤ L < 1310	(0.0500 * Lumens) + 22.5	(0.2500 * Lumens) – 241.5
1310 ≤ L < 1490	(0.0500 * Lumens) + 22.5	(0.0500 * Lumens) + 20.5
1490 ≤ L < 1800	(0.0500 * Lumens) + 22.5	95
1800 ≤ L < 1850	(0.0500 * Lumens) + 22.5	(0.4000 * Lumens) – 625
L ≥ 1850	(0.0500 * Lumens) + 22.5	(0.0500 * Lumens) + 22.5

Table K-8 Standards for State-Regulated Incandescent Reflector Lamps

Rated Lamp Wattage	Minimum Average Lamp Efficacy (LPW)
40-50	10.5
51-66	11.0
67-85	12.5
86-115	14.0
116-155	14.5
156-205	15.0

Table K-9 Standards for State-Regulated General Service Incandescent Lamps -Tier I

Rated Lumen Ranges	Maximum Rated Wattage	Minimum Rated Lifetime	Proposed California Effective Date
1490-2600 Lumens	72 watts	1,000 Hours	Jan, 1, 2011
1050-1489 Lumens	53 watts	1,000 Hours	Jan 1, 2012
750-1049 Lumens	43 watts	1,000 Hours	Jan 1, 2013
310-749 Lumens	29 watts	1,000 Hours	Jan 1, 2013

Table K-10 Standards for State-Regulated General Service Lamps -Tier II

Lumen Ranges	Minimum Lamp Efficacy	Minimum Rated Lifetime	Proposed California Effective Date
All	45 lumens per watt	1,000 Hours	Jan, 1, 2018

Table K-11 Standards for State-Regulated Modified Spectrum General Service Incandescent Lamps - Tier I

Rated Lumen Ranges	Maximum Rated Wattage	Minimum Rated Lifetime	Proposed California Effective Date
1118-1950 Lumens	72 watts	1,000 Hours	Jan 1, 2011
788-1117 Lumens	53 watts	1,000 Hours	Jan 1, 2012
563-787 Lumens	43 watts	1,000 Hours	Jan 1, 2013
232-562 Lumens	29 watts	1,000 Hours	Jan 1, 2013

Table L-1 Ultrasound Maximum Decibel Values

<i>Mid-frequency of Sound Pressure Third-Octave Band (in kHz)</i>	<i>Maximum db Level within third-Octave Band (in dB reference 20 micropascals)</i>
Less than 20	80
20 or more to less than 25	105
25 or more to less than 31.5	110
31.5 or more	115

Table M-2 Standards for Traffic Signal Modules for Pedestrian Control Sold or Offered for Sale in California

<i>Type</i>	<i>at 25°C (77°F)</i>	<i>At 74°C (165.2°F)</i>
Hand or 'Don't Walk' sign or countdown.	10 watts	12 watts
Walking Person or 'Walk' sign	9 watts	12 watts

Table N-1 Standards for Metal Halide Luminaires Manufactured Before January 1, 2009

<i>Lamp Position</i>	<i>Lamp Rating</i>	<i>Effective Date</i>	<i>Requirements</i>
Vertical (base-up)	150-500 watts	Jan. 1, 2006	Luminaires shall not contain a probe-start metal halide ballast.
Vertical (base-down)	150-500 watts	Jan 1, 2008	Luminaires shall not contain a probe-start metal halide ballast.
All	150-500 watts	Jan 1, 2008	Luminaires shall not contain a probe-start metal halide ballast.
All	150-500 watts	Jan 1, 2008	<p>Luminaires with metal halide lamps shall contain metal halide ballasts with a minimum ballast efficiency of 88 percent.</p> <p>Exceptions:</p> <ol style="list-style-type: none"> 1. Luminaires that use electronic ballasts that operate at 480 volts; or 2. Luminaires that meet all of the following criteria: <ol style="list-style-type: none"> a. rated only for 150 watt lamps; and b. rated for use in wet locations as specified by the National Electrical Code 2002, Section 410.4(A); and c. contain a ballast that is rated to operate at ambient air temperatures above 50° C as specified by UL 1029-2001.

Table N-2 Standards for Under-Cabinet Luminaires

Lamp Length (inches)	Minimum Ballast Efficacy Factor (BEF) for one lamp	Minimum Ballast Efficacy Factor (BEF) for two lamps
≤29	4.70	2.80
>29 and ≤35	3.95	2.30
>35 and ≤41	3.40	1.90
>41 and ≤47	3.05	1.65
>47	2.80	1.45

Table N-3 Minimum Requirements for Portable LED Luminaires, and Portable Luminaires with LED Light Engines with Integral Heat Sink

Criteria	Requirement
Light Output	≥ 200 lumens (initial)
Minimum LED Luminaire Efficacy	29 lumens/W
Minimum LED Light Engine Efficacy	40 lumens/W
Color Correlated Temperature (CCT)	2700 K through 5000 K
Minimum Color Rendering Index (CRI)	75
Power Factor (for luminaires labeled or sold for residential use)	≥ 0.70

Table U-2 Standards for State-Regulated External Power Supplies Effective January 1, 2007 for external power supplies used with laptop computers, mobile phones, printers, print servers, scanners, personal digital assistants (PDAs), and digital cameras. Effective July 1, 2007 for external power supplies used with wireline telephones and all other applications.

Nameplate Output	Minimum Efficiency in Active Mode
0 to < 1 watt	0.49 * Nameplate Output
≥ 1 and ≤ 49 watts	0.09 * Ln(Nameplate Output) + 0.49
> 49 watts	0.84
Maximum Energy Consumption in No-Load Mode	
0 to <10 watts	0.5 watts
≥ 10 to ≤ 250 watts	0.75 watts
Where Ln (Nameplate Output) = Natural Logarithm of the nameplate output expressed in watts.	

**Table U-3 Standards for State-Regulated External Power Supplies
Effective July 1, 2008**

Nameplate Output	Minimum Efficiency in Active Mode
<1 watt	0.5 * Nameplate Output
≥ 1 and ≤ 51 watts	$0.09 * \ln(\text{Nameplate Output}) + 0.5$
> 51 watts	0.85
	Maximum Energy Consumption in No-Load Mode
Any output	0.5 watts

Where \ln (Nameplate Output) = Natural Logarithm of the nameplate output expressed in watts.

Table V-1 Standards for Consumer Audio and Video Equipment

Appliance Type	Effective Date	Maximum Power Usage (Watts)
Compact Audio Products	January 1, 2007	2 W in Audio standby-passive mode for those without a permanently illuminated clock display 4 W in Audio standby-passive mode for those with a permanently illuminated clock display
Digital Versatile Disc Players and Digital Versatile Disc Recorders	January 1, 2006	3 W in Video standby-passive mode

Table V-2 Standards for Televisions

Effective Date	Screen Size (area A in square inches)	Maximum TV Standby-passive Mode Power Usage (watts)	Maximum On Mode Power Usage (P in Watts)	Minimum Power Factor for (P \geq 100W)
January 1, 2006	All	3 W	No standard	No standard
January 1, 2011 \pm	A < 1400	1 W	$P \leq 0.20 \times A + 32$	0.9
January 1, 2013	A < 1400	1 W	$P \leq 0.12 \times A + 25$	0.9

Table W-1 Standards for Large Battery Charger Systems

Performance Parameter		Standard
Charge Return Factor (CRF)	100 percent, 80 percent Depth of discharge	CRF \leq 1.10
	40 percent Depth of discharge	CRF \leq 1.15
Power Conversion Efficiency		Greater than or equal to: 89 percent
Power Factor		Greater than or equal to: 0.90
Maintenance Mode Power (E_b = battery capacity of tested battery)		Less than or equal to: $10 + 0.0012E_b$ W
No Battery Mode Power		Less than or equal to: 10 W

Table W-2 Standards for Small Battery Charger Systems

Performance Parameter	Standard
-----------------------	----------

<p>Maximum 24 hour charge and maintenance energy (Wh)</p> <p>(E_b = capacity of all batteries in ports and N = number of charger ports)</p>	<p>For E_b of 2.5 Wh or less: $16 \times N$</p> <p>For E_b greater than 2.5 Wh and less than or equal to 100 Wh: $12 \times N + 1.6E_b$</p> <p>For E_b greater than 100 Wh and less than or equal to 1000 Wh: $22 \times N + 1.5E_b$</p> <p>For E_b greater than 1000 Wh: $36.4 \times N + 1.486E_b$</p>
<p>Maintenance Mode Power and No Battery Mode Power (W)</p> <p>(E_b = capacity of all batteries in ports and N = number of charger ports)</p>	<p>The sum of maintenance mode power and no battery mode power must be less than or equal to: $1 \times N + 0.0021 \times E_b$</p>